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ABSTRACT

The Correlated Curriculum Program is a 4-year career-oriented program designed to provide a more effective educational program for the general course student, with an interdisciplinary approach to teaching. Teachers are organized into teams to plan for correlated lessons. Correlating career subjects with academic subjects serves to reinforce student learning and to improve achievement in all subjects. The document is a teacher's manual designed to assist the mathematics teacher in implementing the Mathematics Correlated with Business Careers curricula. Specific teacher and student activities are suggested and illustrated for each topic, but extensive lesson and unit plans have not been developed. Mathematical skills are developed in various simulated job situations related to six occupational areas: working in a store, in an office, in a warehouse, in a transporting company, in a service industry, and for the government. Additional, noncorrelated lessons are suggested to round out the students' mathematics education. Resources and references are listed in the appendix. (Author/AJ)

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CURRICULUM PROJECT REPORT

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CORRELATED CURRICULUM PROGRAM

An Experimental Program

MATHEMATICS Level I (9A, 9B, 10A)
(Correlated with Business Careers)

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Project No. 10006

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May 1970

BUREAU OF CURRICULUM DEVELOPMENT
BOARD OF EDUCATION • CITY OF NEW YORK
181 Livingston St., Brooklyn, New York 11201

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CORRELATED CURRICULUM PROGRAM

TEACHERS' MANUAL-MATHEMATICS CORRELATED WITH BUSINESS CAREERS-LEVEL I

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CORRELATED CURRICULUM PROGRAM

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TEACHERS' MANUAL-MATHEMATICS CORRELATED WITH BUSINESS CAREERS-LEVEL 1

Introduction

The Correlated Curriculum Program is a four year career-oriented program designed to provide a more effective educational program for the general course student. Unlike the traditional general course in the academic high schools, the approach to teaching is interdisciplinary. Teachers are organized into teams to plan for correlated lessons and include business careers, mathematics, science and English teachers. The correlation of career subjects with academic subjects serves to reinforce student learning and to improve achievement in all subjects.

To assist teachers in implementing the curricula, the following materials are available:

- a course outline indicating correlation among the disciplines; business careers, science, mathematics and English
- a detailed course of study in each subject area
- student workbooks for the business careers class. (in preparation)

Design of the Manual

This teachers' manual is designed to assist the mathematics teacher in implementing the Mathematics Correlated with Business Careers curricula. Although the course of study in Business Careers offers the opportunity for close correlation with mathematics, the development of extensive lesson and unit plans was not possible because of the exigencies of time. However, specific teacher and student activities are suggested and illustrated for each topic. Resources and references are listed in the appendix.

At team planning meetings, resourceful teachers may utilize these suggestions or use them as a point of departure for developing more imaginative correlated lessons. Additional, non-correlated lessons are suggested to round out the mathematics education of the students in the program.

Objectives

1. To develop an understanding of number concepts which are requisite for the exploration of business careers.

2. To improve skills in fundamental processes related to business careers.

3. To apply mathematical skills as they are used in an orientation to specific jobs in a beginning course in business careers.

4. To develop habits of accuracy, neatness, orderliness and systematic procedures in entry vocations in business careers.

5. To provide a rounded background of mathematical concepts and abstractions for an understanding of commonly used numbering systems and for a broad general mathematical education.

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Special Techniques

Many of the students in the program have experienced repeated failure in the study of mathematics and have failed to master the basic fundamental processes --adding, subtracting, dividing and multiplying. Attempts to teach the fundamentals at this time would probably meet with resistance from the students. Therefore, a new approach is indicated. After students have been motivated and have completed sample business problems, methods of improving accuracy and speed in the fundamental process(es) applicable can be introduced. The review should not be presented as arithmetic problems. Continuity of instruction should not be interrupted for review. By continuing the utilization of business forms and problems, the review can become a natural part of business training.

Since the Correlated Curriculum Program is designed to meet the needs of the slow learner, it is appropriate at this point to indicate some techniques that have been successfully used in teaching the slow learner:

1. Slow learners learn best through experiences with concrete things. Students should be given the opportunity to experience activities such as measuring areas, counting play money, role-playing business activities and the like. The teacher may then introduce an abstract concept, returning frequently to concrete illustrations to reinforce the abstract concept.

2. Slow learners have difficulty in dealing with generalizations. They profit from detailed explanations and repetition of familiar material. The teacher should lead students through a series of short sequential steps to develop concepts.

3. Some students have difficulty in reading and understanding written problems and instructions. Through oral reading of the mathematical problems, the teacher can identify and clarify difficulties that may be encountered.

4. Since the attention span of the slow learner is relatively short, the teacher should plan to vary the activities during a teaching period. Activities may include: teacher or student demonstrations, viewing films or film strips, completing problems on the chalkboard or on a transparency used with the overhead projector, playing mathematical games, role-playing job activities in business, and so forth.

5. Slow learners frequently demonstrate that they can perform simple computations and apply simple mathematical rules that they learned by rote. Although repeated drill is desirable in teaching the slow learner, continual re-motivation of the drill process is also needed. The student should clearly understand the reasons for what he is doing. The teacher should constantly check to see that the student is using correct procedures.

6. Praise from the teacher often proves to be an effective stimulus to higher achievement. An effective motivation is afforded by direct correlation with the business careers class by applying mathematical skills to the business training activities.

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Provision for Individual Differences

To provide for individual differences in mathematical ability, aptitude and achievement, include problems of graduated difficulty and length on problem sheets. It should not be expected that all students will be able to complete all of the problems. It is suggested that students be advised of the number of accurately completed problems that will be acceptable. Accurate completion of all of the problems should be recognized and rewarded to encourage maximum effort.

The teacher should seek opportunities to provide individual instruction while students are completing computations. A particularly apt student may be called upon to assist another student.

The teacher may utilize programmed material to assist students in improving mathematical skills. The materials may be used in the classroom, or assigned as homework. (See the appendix for listing of programmed materials.)

Measurement and Evaluation

It is inherent in this program for the student to achieve some measure of success since previous educational experiences had resulted in frustration and failure. The standard system of grading examinations and judging classroom participation are not adequate. Without disregarding these two measure of achievement, the teacher should also consider

- .the effort put forth by the student
- .the ability to adjust to the classroom situation
- .completion of homework
- .completion of extra assignments
- .the ability to relate areas concerning their own lives to their studies.

Through the use of short quizzes at frequent intervals, there is an opportunity to observe weaknesses and to provide for whatever remedial teaching or special assignment that may be necessary.

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ORIENTATION
(1-2 lessons)

What mathematical skills will you need for a career in business?

Why are skills in mathematics requisites for a career in business?

Teacher Activities

Elicit kinds of businesses that students are familiar with. Discuss math skills used in each business. Challenge the class to find a business which does not rely on mathematical skills in its operations. Be prepared to counter this example with a brief discussion on paying salaries. To show that mathematics is of major importance in all fields of business, use a chart similar to the one below:

Kind of Business	Job	Mathematical Skills Used
Food Store	Cashier	Make change (addition and subtraction), finding the cost of one item in multiple cost items (division), sales tax (percent and decimals)
	Stock clerk	number of items in a carton (gross, dozen, multiplicant)
Transportation	Bus driver	
Office	Payroll Clerk	
Other		

Note: Discuss as broad a range of businesses as possible to show that mathematical skills are a requisite for a career in business.

Student Activities

Ask students to copy the chart in their notebooks, and to complete the chart by adding at least two additional businesses, jobs found in each, and the mathematical skills used.

As a homework assignment, students may be asked to interview at least three working people to find how they use mathematics on their jobs. This information may be added to the chart.

DIAGNOSTIC TEST

A diagnostic test such as, Arithmetic Computation Test 7-12, may be administered to ascertain specific mathematical weaknesses of the students. The results may be used at a later date as a basis for comparing progress made by each student.

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MATHEMATICAL SKILLS FOR WORKING IN A STORE
(12-16 lessons)

Cashier-Checker

Making change

Teacher Activities
As a motivational device, the students may organize a supermarket: Correlated Corporation Supermarket.

Ask students to relate the procedures used by a cashier in making change. Demonstrate how to make change: if the bill is $3.86, give the customer 4¢, say $3.90; a dime, say $4.00; $1.00, say $5.00, thank you. Stress the principle of subtraction by addition. Discuss denomination of currency in common use.

To practice making change, duplicate and distribute a chart:

Total Bill	Customer Gives You		Change (Say Amount Out Loud)									
			1¢	5¢	10¢	25¢	50¢	$1	$5	$10	$20	
$ .75	$1.00	say .75										$1.00 "Thank you"
1.35	2.00	say ____										____ "Thank you"
2.75	5.00	say ____										____ "Thank you"
3.66	10.00	say ____										____ "Thank you"

Ask students to check change by adding change to amount of the bill and subtracting from money tendered.

Student Activities
Students may role-play making change by using play money, and alternating the roles of customer and cashier.

Problems on the chart that are not completed in class may be assigned as homework.

Finding the cost of one item in multiple-priced items

Teacher Activities
Price-marked cans and packages will be valuable in illustrating the importance of knowing how to determine unit price when items are marked in multiple units. For example: "This can is marked 3/79¢. I want to buy only one can. How much would I have to pay for it?" Demonstrate how to determine the price by short division, how to round off fractions. Ask students to determine the cost of one item a "2for", 2 items at "3for" by this method Demonstrate the use of a chart:

Price	Cost per number of items purchased				
	1	2	3	4	5
2/19	.10				
3/19	.07	.13			
4/19	.05	.10	.15		
6/89	.15	.30	.45	.60	.75
5/99					
3/35					

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Duplicate and distribute a chart with a variety of multiple prices. Ask students to complete the chart.

Student Activities

Work not completed in class may be assigned as homework. Students may add multiples not included on the chart after visiting a supermarket or checking prices on items in the home.

Determining the amount of tax to be added to the bill

Teacher Activities

Explain the New York City 6% Sales Tax structure: (3% New York State Tax, plus 3% New York City Tax) must be added for all items sold EXCEPT food and medicine prescribed by a doctor. Demonstrate how to determine tax for a taxable item that is sold for: 25¢, $1.30, etc. Stress changing percent to a decimal, multiplying a decimal by a decimal. Have students formulate a tax chart for amounts of 1¢ to $1.50. Duplicate and distribute a sales tax chart.

Amount of Sale	Tax to be Collected
1¢ to 10¢	None
11¢ to 20¢	1¢
21¢ to 35¢	2¢
36¢ to 55¢	3¢
56¢ to 70¢	4¢
71¢ to 85¢	5¢
86¢ to $1	6¢
On sales of $1.00 or more: add 6¢ for each $, then add the amount shown above for amounts less than $1.	

Student Activities

Ask students to complete a chart indicating sales tax to be added

Taxable Sale	Amount of Sales Tax	Total
$ .84	$ .05	
.29		
2.65		

Work not completed in class may be assigned as homework. Students may be asked to complete work on changing percents to decimals and vice versa.

Redeeming coupons

Teacher Activities

Show a variety of coupons. Discuss: Where do customers obtain coupons? Why do businesses offer "money off" or "free sample" coupons? Why is the storekeeper willing to handle coupons? Discuss the responsibility of the cashier with regard to: expiration date, quantity of items that must be purchased, size of items, brand name.

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Demonstrate how the cashier should deduct the value of the coupon tendered if there is no "Coupon" key on the cash register. Duplicate and distribute a worksheet:

Quantity	Item	Selling Price	Value of Coupon	Amount Charged
3	Jello	2/39	10¢ on 3 items	
3	Ivory Soap (Bath Size)	15¢ each	1 free with every 2 purchased	
1	Imperial Margarine	39¢ pound	9¢ off	

Student Activities

Ask students to complete the worksheet. All work not completed in class may be assigned as homework.

Dispensing trading stamps

Teacher Activities

Discuss: Why do stores issue trading stamps? Why do customers save trading stamps? How does the issuing of trading stamps effect the shelf prices of merchandise?

Demonstrate how to compute the number of trading stamps to be dispensed for bills totaling $56.90, 89¢, $7.08 if one trading stamp is given for each 10¢ purchase. Denominations of stamps are 10¢ and $1.

Duplicate and distribute a worksheet:

Amount of Sale	Trading Stamps Issued	
	10¢	$1
$1.85		
2.29		

Student Activities

Ask students to complete the worksheet. Work not completed in class may be assigned as homework.

Packing merchandise

Teacher Activities

The bag sizes most commonly used in supermarkets are: 20 pound, 1/8 barrel, 1/6 barrel. Introduce the concept of volume. Discuss the importance of selecting the smallest bag that will carry the load, and using the least number of bags that will carry the load. (The cost of bags: 20 lb-.5¢, 1/8 barrel-.7¢, 1/6 barrel-1¢)

Duplicate and distribute worksheets with problems on volume and weight.

Student Activities

Ask students to complete worksheets. Any work not completed in class may be assigned as homework.

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Stockclerk

Stocking shelves

Teacher Activities

Elicit items of food and other merchandise that may be found in a supermarket. List the items on the blackboard. Ask the students to copy the list into their notebooks. Discuss departmentalization in a supermarket, dairy, produce, grocery, meat, other.

Elicit types of packaging used for each of the items listed. Discuss sizes and weights of packages, #2 can, 3/38 oz., 1 lb. 2 oz., etc.

Explain that most items arrive in cartons, and cartons are not uniform in content. A carton may contain a gross, a dozen, and so forth. Students should become familiar with weights, measures and quantities and be able to answer questions such as, how many dozen cans in a carton which contains 72 cans? How many cans are in 5 1/2 dozen? How many boxes of candles are there in 2 1/2 gross?

Student Activities

Ask students to write the item under the proper department in which it may be found, using the list of items copied from the blackboard.

Dairy	Produce	Grocery	Meat	Other

Ask students to complete the following:

Carton Contents	Number of Items		
	Units	Dozen	Gross
2 1/2 doz. #2 cans			
1 1/2 gross shovels			
60 pkgs. napkins			
etc.			

Building mass displays

Teacher Activities

Discuss: Why are mass displays used in supermarkets?
How many items should be placed in a supermarket display?

Explain the concept of the Pascal triangle:

```
          1
        1   1
      1   2   1
    1   3   3   1
  1   4   6   4   1
```

Show other mathematical applications of the Pascal triangle.

Student Activities

Ask students to bring a specific size can or package to class. Ask them to stock 15 cans or packages in an effective display.

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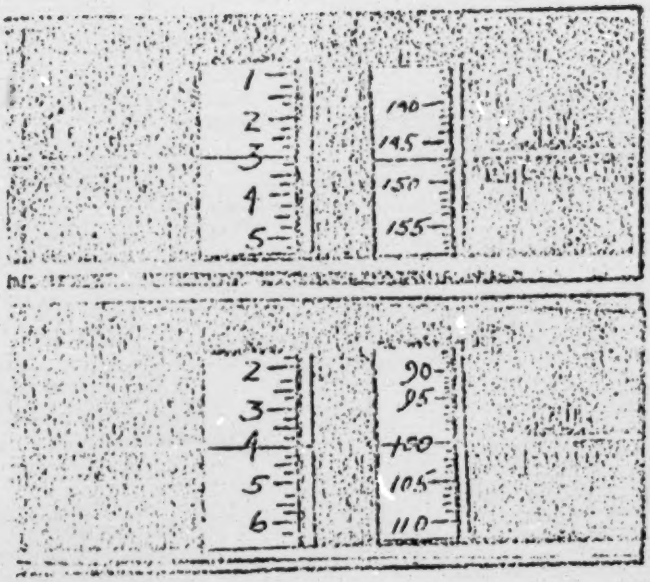
Teacher Activities

Ask students to compute the cost of 1.7 lbs of candy at 63¢ per pound. Use a transparency of a scale on an overhead projector to demonstrate how to read 1.7 lb at 63¢ per pound on the weigh scale. Duplicate and distribute worksheet-reading a weigh scale. Ask students to check their results by multiplication.



3 lbs. @ 49¢ = _____

4 lbs. @ 25¢ = _____

Student Activities

Ask students to complete the worksheet-reading a weigh scale. Work not completed in class may be assigned as homework.

SALESCLERK

Completing sales checks

Teacher Activities

As a motivational device, students may be employed by the Correlated Department Store as salesclerks. Distribute sales slips. Demonstrate how to complete a sales slip with the use of an overhead projector. Ask students to prepare a sales slip for a customer who purchases: 8 dinner plates at $68.40 per dozen, 4 tablecloths at $3.65 each, 8 napkins at 89¢ each, and 2 candleabra at $5.60 each. Remind students to add 6% sales tax to the bill.

Prepare and distribute worksheets and a variety of sales slip forms. The teacher will have the opportunity to provide assistance to individual students while the class is engaged in completing the sales checks.

Student Activities

Ask students to complete the problems on the worksheet. Problems not completed in class may be assigned as homework.

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Computing quantity of material required by the customer

Teacher Activities

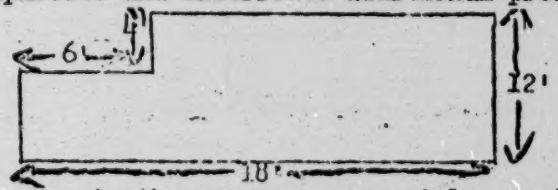
Elicit which items sold require a knowledge of computing measurement such as, carpeting, yard goods, shelving, wallpaper, tiles, etc. Present a typical sales problem:

Mr. and Mrs. D. Liver have selected carpeting for their living room which is 9 feet by 12 feet. The carpeting they have selected is priced at $12.50 per square yard. They want to know how much they will have to pay for the carpeting.

Use the chalkboard or a transparency on the overhead projector to demonstrate how to compute the amount of carpeting needed for the area. (Formula-area of a rectangle is equal to the product of the length and width. A=lw.)

Compute the cost by multiplying the area (in square yards) by the cost per square yard.

Duplicate and distribute additional problems.



To compute the amount of materials required for an area of composite figures, divide the area into two rectangles, find the missing dimensions, find the area of each rectangle, and find the sum of the rectangles.

Additional problems may be found in the 9th year General Mathematics Curriculum Bulletin, pages 69-77, and in ON THE JOB, pages 59-60.

Sales problem in computing yardage:
Miss Singer wants to buy enough fabric for three dresses and two skirts. Each dress requires 3 1/4 yds. of fabric and each skirt, 1 1/2 yds. What is the total amount of fabric Miss Singer should buy? How much will she pay if the fabric is $1.80 a yard? (Remind students to add sales tax to the bill.)

Review measurements: How many feet are there in 1/4 yard? In 5 1/4 yards? How many inches in 5 feet six inches? Use a chart for converting measurements:

Quantity	No. of Yards	No. of Feet	No. of Inches
6 yards	6	18	216
3 yds 3'			

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Student Activities

Ask students to complete problems in measurement of area and yardage.

Students may measure the floor or a wall area in a room at home to determine the amount of carpeting or wallpaper that would be required for the room.

Computing capacity

Teacher Activities

Advertisements for refrigerators or air-conditioners may be used for motivating the teaching of concepts of volume and capacity. Demonstrate how to determine the number of cubic feet in a refrigerator using the formula for volume V=lwh.

Duplicate and distribute additional problems. Additional problems may be found in the 9th year General Mathematics Curriculum Bulletin, pages 83-90.

Student Activities

Ask students to complete problems. Problems not completed in class may be assigned as homework.

Comparing rental costs with the cost of purchasing

Teacher Activities

Pose the problem:

The Correlated Merchanding Corporation wants to publish a monthly newsletter for their customers. The newsletter is to be printed on a mimeograph machine. The printing can be completed in three days. The cost of the machine is $850. The company can rent a machine for $6 a day. Should the Correlated Merchandising Corporation buy the machine or should they rent it? Why?

Discuss the advantages and disadvantages of renting machinery and equipment.

Elicit items of machinery and equipment available for rental.

Prepare and distribute additional problems comparing rental costs with the cost of purchasing an item.

Student Activities

Ask students to collect newspaper advertisements offering machinery and equipment for rent, and to use the information to complete a comparison chart.

Item	Cost (New)	Cost (Used)	Cost (Rental)	Under these circumstances I would recommend rental:

Students will complete mathematical problems involving comparing the cost of renting equipment with the cost of purchasing the equipment.

Ordering Merchandise

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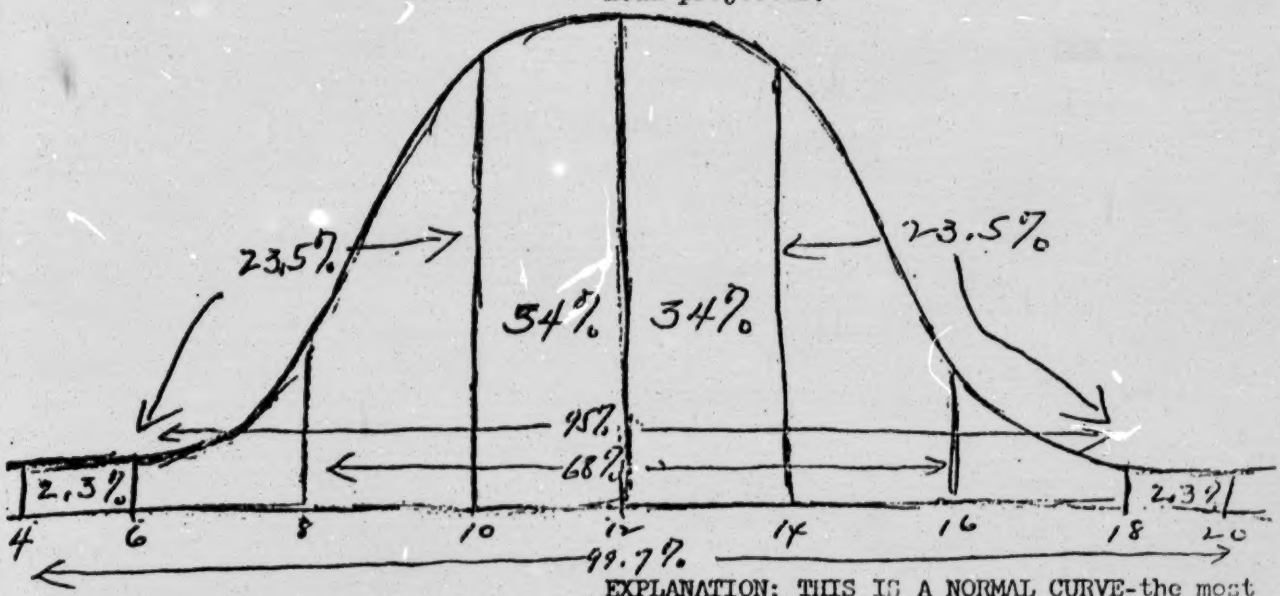
Teacher Activities

Pose the following problem:
Miss Mendez has just been promoted to the job of buyer of ladies dresses. She has selected a style that she feels will be very popular next season. The dress is made in sizes 4,6,8,10,12, 14,18, and 20. Miss Mendez plans to order 144 dresses. How many dresses of each size should she order?

Discuss factors affecting the demand for various sizes such as, the age of the customers, ethnic backgrounds (certain ethnic groups tend to be smaller or larger in size than the average customer), and other influences on the needs of customers.

Duplicate an illustration for distribution to the students, or prepare a transparency for the overhead projector.



EXPLANATION: THIS IS A NORMAL CURVE-the most popular size for women is size 12. 68% of the population falls between sizes 10 and 14, 95% of the population fall between sizes 6 and 18, and 99.7% falls between sizes 4 and 20.

Ask each student to write his shoe size (anonomously) on a piece of paper. Tabulate the results on a graph to determine if the class has a size range that falls within the normal curve. (Explain the limitations of a small sample of a large population.)

Student Activities

Using the concept of the "bell curve" prepare orders for the following:

288 Dresses to be ordered

Size:	4	6	8	10	12	14	16	18	20
Number									

144 Suits to be ordered

Size	34	36	38	40	42	44	46	48
Number								

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MATHEMATICAL SKILLS FOR WORKING IN AN OFFICE

Comparing methods of wage payment

Teacher Activities

Discuss various methods of wage payments:

Job Title	Method of Payment
Plumber	Hourly wages
Secretary	Weekly wages
Industrial Sales	Commission
Seamstress	Piecework
Other	

Compare methods of wage payment: "Which job would you prefer, one that pays $3 an hour for a thirty-five hour week, or one which pays $110 a week for a forty hour week?"

Totaling hours worked from a time card

Duplicate and distribute a sample time card, or use a transparency on the overhead projector to demonstrate how to compute time worked from a time card.

Example:
The scheduled work time for L. Adams is 8 A.M. to 5 P.M. Time off for lunch is one hour.

V.T.1212 WEEK ENDING NOV 2 19[illegible]

NO. 5

NAME L. Adams

	MORNING		AFTERNOON		OVER-TIME TOTAL	DAILY TOTAL
	IN	OUT	IN	OUT		
M	57[illegible]			2 50[illegible]		
T	2 7[illegible]			4 5[illegible]		
W	2 7[illegible]			5 00		
Th	2 7[illegible]			5 00		
Fr	2 7[illegible]			4 3[illegible]		

REG. HRS. _____ + O.T. HRS. _____ = _____ TOT. HRS. _____

Analysis

M. Work starts at 8:00 A.M. Time IN earlier than 8:00 A.M. is not counted. 8:00 A.M. to 5:00 P.M. is a total of nine hours, less one hour for lunch. L. Adams is credited with eight hours for Monday.

Tu. 4:59 P.M. is credited as 5:00 P.M. L. Adams is credited with eight hours for Tuesday.

W. L. Adams is credited with eight hours for Wednesday.

Th. L. Adams is credited with eight hours for Thursday.

Fr. L. Adams is credited with seven and one half hours for Friday.

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Duplicate and distribute illustrations of time cards. Include examples of irregular working hours and overtime.

Discuss "time and a half" for overtime. Demonstrate how to compute overtime.

Overtime	Rate of Pay	Time and a Half	Pay Total
3 hours	$2.10	$3.15	$9.45
2 hours	$2.60		

Computing gross pay
(Wages before deductions)

Demonstrate how to compute gross pay. The following is a payroll record for an electrical company. Employees work a six hour day and are paid at the rate of time and a half for overtime.

Name	Hourly Rate	Hours Worked M.	T.	W.	Th.	F.	Total Hours Reg.	O.T.	Earned Reg.	O.T.	Total Wages
Brown	$2.20	7	6	7	7 1/2	6					
Green	$1.60	8	7	7	6	6					
Blue	$5.10	7	6	7	7	8					

Student Activities

Ask students to complete the gross pay chart. Problems not completed in class may be assigned as homework.

Computing net pay

Teacher Activities

Miss Right earns $100 a week as a clerk. Does Miss Right take home $100 a week?

Elicit deductions made: Social Security; Income Tax, Federal, state and city; Hospitalization, Disability; Pension; Union Dues, Bonds; Garnishee. Discuss the voluntary and mandatory deductions. Discuss "exemptions claimed" for tax purposes.

Duplicate and distribute copies of deduction table for Social Security, the various income taxes, and Disability. Demonstrate the use of the tables.

Compute Social Security by multiplying the total wages by the current rate. Check the results with the Social Security table.

PAYROLL WEEK ENDING JAN. 30, 19--

• NAME OF EMPLOYEE	• DAYS AND HOURS No. of Exemptions	M 26th	T 27th	W 28th	Th 29th	F 30th	S			WAGE RATE	• WAGES REGULAR WAGES	OVERTIME WAGES	TOTAL	• EMPLOYEE DEDUCTIONS FED. OLD AGE	FED. WITHHOLD TAX	STATE WITHHOLD TAX			TOTAL	NET PAY
1 ALLISON, MARGARET	1	8	8	8	8	8	4			1.75										
2 BENSON, RALPH	2	7	7	7	7	7				2.10										
3 CARLSON, GEORGE	1	8	8	8	8	8	4			1.15										
4 DIRKSON, ELLIOT	3	7	7	7	7	7				2.85										
5 ERICKSON, HAROLD	4	8	8	8	8	8	4			3.00										
6 FREDRICKS, LLOYD	2	8	8	8	8	8				5.10										

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Preparing a denominational analysis for cash wage payment

Student Activities

Ask students to complete the payroll. Work not completed in class may be assigned as homework.

Teacher Activities

Review currency denominations to the $500 bill. Duplicate and distribute a completed payroll, and a cash analysis form. Demonstrate how to make a cash analysis.

PAYROLL WEEK ENDING JAN. 30, 19--

• NAME OF EMPLOYEE	• DAYS AND HOURS									WAGE RATE	• WAGES			• EMPLOYEE DEDUCTIONS					NET PAY
	No. Exs.	M 25	T 26	W 27	TH 28	F 29	S 30	TOTAL REG. TIME	TOTAL OVERTIME		REGULAR WAGES	OVERTIME WAGES	TOTAL	FED. OLD AGE	FED. WITH-HOLD. TAX	STATE WITH-HOLD. TAX	SICKNESS BENEFITS	CITY WITH-HOLD. TAX	TOTAL
1 AIKEN, MORTON	1	8	8	8	8	8		40		2.10	84 00	-	84 00	3 10	10 20	1 20	30	50	11 50	67
2 BRENNAN, ALICE	0	8	8	8	8	8	4	40	4	1.90	76 -	11 40	87 40	3 35	13 70	1 80	30	70	20 05	66
3 COLLINS, JAMES	2	8	8	8	8	8	6	40	6	3.40	96 -	21 60	117 60	5 17	14 [illegible]	2 00	30	75	22 [illegible]	9
4 DONNELLY, FRANK	3	8	8	8	8	8	2	40	2	2.65	106 -	7 95	113 95	5 01	11 40	1 60	30	60	18 11	96
5 ELLERS, WILLIAM	1	8	8	8	8	8	4	40	4	2.50	100 -	15 00	115 00	5 01	16 40	2 30	30	80	25 01	90
6 FARMER, CARL	1	8	8	8	8	8		40		2.25	90 -		90 00	3 51	11 [illegible]	1 50	30	60	18 [illegible]	71
7 GAINES, JEFFREY	2	8	8	8	8	8	4	40	4	3.15	126 -	18 90	144 90	6 38	19 [illegible]	3 00	30	1 00	30 [illegible]	11
8 HART, FRANCES	3	8	8	8	8	8	4	40	4	2.35	94 -	14 10	108 10	4 70	16 [illegible]	1 80	30	50	17 [illegible]	91
9 INNES, JOHN	1	8	8	8	8	8		40		2.75	110 -		110 00	4 84	15 [illegible]	2 20	30	75	22 [illegible]	84
10 JONES, MARGARET	1	8	8	8	8	8		40		1.85	74 -		74 00	3 26	9 20	50	30	45	13 [illegible]	1
11																				
12					TOTAL						956 -	88 [illegible]	1044 [illegible]	45 98	131 50	17 70	3 00	1 15	201 [illegible]	94

CASH ANALYSIS

Name	Cash to be paid	BILLS				COINS				
		$20	$10	$5	$1	50¢	25¢	10¢	5¢	1¢
AIKEN, MORTON	67.50	3		1	2	1				
BRENNAN, ALICE	66.25	3		1	1	1	1	2		
	TOTAL									

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Using the completed cash analysis, demonstrate how to prepare a currency memo for the bank.

Denominations	Number	Total Value
$20		
$10		
$5		
$1		
.50		
.25		
.10		
.05		
.01		

Student Activities

Ask students to complete the cash analysis and to prepare a currency memo for the bank.
Using play money, students may count out net pay for each employee on the payroll. Additional problems may be found in General Mathematics Curriculum Bulletin pages 96-106 and Useful Arithmetic pages 28-32.

TELEPHONE OPERATOR

Computing monthly telephone bills

Teacher Activities

Duplicate and distribute a sample telephone bill, or use a transparency on the overhead projector. Discuss terms appearing on the bill such as message units, home econ-o-call, and so forth.

Determining the cost local calls

Demonstrate how to determine the number of message units charged for various calls. For example: If you are calling 440-1234 from 383-2751, there is no charge for the call. A complete listing of message unit charges may be found in the front of many of the telephone directories.

Message unit charges from telephones in:

Bedford—Stuyvesant, Boro Hall, Boro Park, Brownsville, Bushwick, East New York, Flatbush, Greenpoint, Williamsburg and vicinities starting with:

235	383	451	486	647	789	071	JA 2
237	384	452	487	693	821	075	MA 2-4-5
270	385	453	488	756	827	967	MI 7
277	386	455	489	760	834	AP 7	NA 8
282	387	456	522	771	851	BU 2-4-7	NE 8
284	388	462	596	772	852	DI 2-5-6	PR 1-2-3-4-6
287	389	467	622	773	853	EM 6	SL 6
342	434	468	624	774	854	EV 1-2-3-4-5-6-7-8	SO 8
345	435	481	625	778	855	GE 4-5-6-8-9	ST 2-3-8-9
348	436	482	629	780	856	GL 1-2-3-5-6	TA 7
366	438	483	635	782	857	HI 5	TR 1-5
381	439	484	638	783	858	HY 1-2-3-4-5-6-7-8-9	UL 1-2-3-4-5-6-7-8-9
382	443	485	643	789	859	IN 2-7-9	VA 1

see page 14 for other Brooklyn central office codes.

The number of message units charged for the initial period of your call is shown beside the central office code of the telephone you're calling.

to New York City (no area code required)

The initial charge for calls to all New York City telephones (listed on pages 15, 16 and 17) is one message unit except to those central offices listed below.

Telephones Initial starting with charge	Telephones Initial starting with charge	Telephones Initial starting with charge	Telephones Initial starting with charge	Telephones Initial starting with charge	Telephones Initial starting with charge	Telephones Initial starting with charge	Telephones Initial starting with charge
233 2	383 ..... No charge	440 ..... No charge	647 2	654 2	695 2	AR 9 2	DI 2-3-4-5 2
273 2	384 ..... No charge	442 2	648 2	655 2	703 2	BI 3 2	EA 7 2
324 2	385 ..... No charge	447 2	649 2	727 2	704 2	DA 4-5 2	HI 5 2
325 2	386 ..... No charge	448 2	666-1712 No charge	801 2	705 2	EL 6 2	JO 3-4-6 2
353 2	387 ..... No charge	543 2	692 2	802 2	706 2	GL 2-3-8 2	KE 4 2
356 2	388 ..... No charge	546 2	693 2	804 2	AD 1 2	KI 5-6-7-8-9 2	SU 3-4-7 2
370 ..... No charge	389 ..... No charge						

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additional charges apply after the initial period

If the charge for the initial period is:	The initial period is:	The additional charge is:
2 message units	5 minutes	1 message unit for each additional 3 minutes or fraction
3 or 4 message units	5 minutes	1 message unit for each additional 2 minutes or fraction
5 message units	5 minutes	1 message unit for each additional 1 minute or fraction
6 message units	4 minutes	1 message unit for each additional 1 minute or fraction

Calling From	To	No. of Minutes	Message Units Charged
235-1291	948-7891	7	
693-6715	919-1356	9	

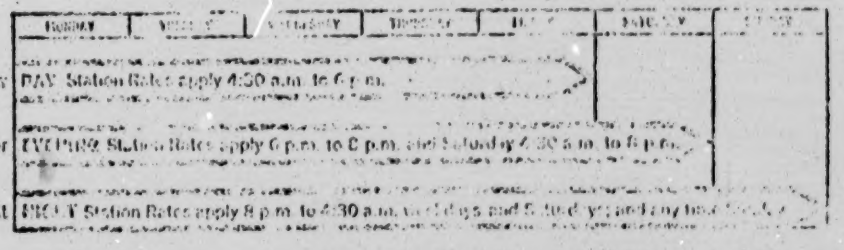
Determining the number of telephone numbers possible within a given area code

The concepts of permutation and combination may be introduced for purposes of enrichment. For example: The area code in New York City is 212. If the first three numbers cannot be 0 or 1, how many phone numbers are possible? (8 times 8, times 8, times 8, times 10, times 10, times 10, times 10.) Results may be verified by checking with the telephone company.

Determing the cost of long distance calls

Discuss long distance rates, station-to-station, person-to-person, day rates, evening rates, night rates, holiday rates.

long distance rates


Low
DAY Station Rates apply 4:30 a.m. to 6 p.m.
Lower
EVENING Station Rates apply 6 p.m. to 8 p.m. and Saturday 4:30 a.m. to 8 p.m.
Lowest
NIGHT Station Rates apply 8 p.m. to 4:30 a.m.

Lowest person to-person rates are in effect Mon.-Sat., 6:00 p.m. to 4:30 a.m. and any time on Sunday.

For three holidays, Thanksgiving, Christmas, New Years Day, lower EVENING rates are in effect until 8 P.M. for station-to station calls. After 8 P.M. lowest NIGHT Station Rates apply. On person-to person calls lowest rates apply anytime on these three holidays. For all other holidays, the rates in effect are those for that day of the week.

The typical rates below are for the first three minutes and do not include the Federal Excise Tax or any applicable state or local sales taxes. The time at the calling point governs the application of these rates.

	station			person	
	day	evening	night	day	night
Calif., Los Angeles	2.00	1.30	1.00	3.50	3.00
Colo., Denver	1.70	1.20	.90	2.85	2.45
Conn., Hartford	.55	.40	.40	.85	.70
Del., Wilmington	.60	.45	.45	.95	.80
D. C., Washington	.80	.60	.60	1.20	1.00
Fla., Miami	1.55	1.10	.80	2.50	2.15
Ga., Atlanta	1.40	1.00	.70	2.20	1.90
Ill., Chicago	1.40	1.00	.70	2.20	1.90
La., New Orleans	1.55	1.10	.80	2.50	2.15

	station			person	
	day	evening	night	day	night
Mo., St. Louis	1.45	1.05	.75	2.35	1.95
N. J., Atlantic City	.55	.40	.40	.85	.70
N. Y., Albany	.70	.55	.40	1.10	.95
N. Y., Buffalo	1.05	.85	.60	1.65	1.35
N. Y., Montic Ro	.55	.45	.40	.85	.75
N. Y., Poughkeepsie	.50	.40	.40	.80	.70
N. Y., Riverhead	.55	.45	.40	.85	.75
Ohio, Cleveland	1.15	.85	.65	1.80	1.45
Pa., Philadelphia	.50	.40	.40	.80	.70

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MATHEMATICAL SKILLS FOR WORKING IN A WAREHOUSE

Order Clerk

Reading large numbers

Student Activities

Ask students to complete determining the number of message units charged for various calls, and to determine the cost of specific long distance calls.

Teacher Activities

Review reading large numbers.

Billions			Millions			Thousands			Hundreds		
HUNDREDS	TENS	UNITS	HUNDREDS	TENS	UNITS	HUNDREDS	TENS	UNITS	HUNDREDS	TENS	UNITS

Present the following problem:

Mr. Johnson is an order clerk for a machine parts warehouse. All of the parts are kept in bins according to the stock number. Mr. Johnson received an order for the following parts. In which bin will he find each of the parts?

	Bin #		Bin #
#24633	_____	#36107	_____
#37421	_____	#19001	_____

Matching number

#1 10351-12750	#2 12751-15750	#3 15751-17550	#4 17551-19550
#5 19551-21250	#6 21251-24750	#7 24751-27550	#8 27551-30500
#9 30501-32750	#10 32751-35550	#11 35551-38750	#12 38751-41250

To emphasize the importance of selecting the correct item by a stock number designation, ask students to match numbers:

345627	354267
352678	352768

Student Activities

Complete the identification of the bin number in which a designated item of stock may be found

Practice matching numbers.

Stock Clerk

Teacher Activities

Review quantities: units, dozen, gross.

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Taking inventory

Duplicate and distribute a sample inventory form. Demonstrate how to compute the extensions on the inventory form.

CHECK	QUANTITY	DESCRIPTION	✓	PRICE	EXTENSIONS
	2 doz	# 4705 Y GREEN		$1.10 ea	
	½ gr.	# 4705 Y BLUE		1.10 ea	
	27	# 3765 5 Yellow		2.1 ea	
	4½ doz	# 1 Y 378 BLUE		1.89 ea	
	37	# 14576 BLACK		.75 ea	
	28	# Y6351 PINK		1.25 ea	
		TOTAL			

Student Activities

Ask students to complete the extensions and totals on an inventory. Work not completed in class may be assigned as homework.

MATHEMATICAL SKILLS FOR WORKING FOR A TRANSPORTING COMPANY

Ticket Agent

Comparing charges for various travel plans

Teacher Activities

Duplicate and distribute a copy of a fare rate schedule. Demonstrate how to read the schedule. Discuss the advantages and limitations of the various flight plans, and the reasons for the differences in the rates. Discuss: one way fare round trip, scheduled flights, charter flights, family plan, excursion fare, first class fare.

Present problems:

Miss Keller wants to fly from New York to Athens Greece. She is interested in the least expensive flight plan. What would you suggest?

The New York Social Club members, 46 of them, want to travel to Cairo, Egypt and return in 30 days. How much would it cost each member for the round trip?

Reading rate charts

	DOMESTIC				
	ONE WAY		ROUND TRIP		
	Jet First Class	Jet Coach	Jet First Class	Jet Coach	Discover America Jet Excursion
Albuquerque	148	109	296	218	174
Amarillo	123	96	246	192	154
Baltimore	25	20	50	40	32
Boston	25	20	50	40	32
Chicago	64	51	128	102	82

	INTERNATIONAL					
	ONE WAY			ROUND TRIP		
	First Class	Peak Period Economy	Regular Economy	First Class	Peak Period Economy	Regular Economy
Athens	542.50	406.10	343.00	1085.00	812.20	686.00
Bangkok	960.20	640.00	640.00	1920.40	1280.00	1280.00
Bombay	922.60	564.00	564.00	1845.20	1128.00	1128.00
Cairo	635.60	475.60	476.00	1271.20	951.20	952.00
Colombo	1015.60	671.20	671.20	2031.20	1342.40	1342.40

P. Via the Pacific. All other fares via the Atlantic.

YOUTH FARE TRAVEL PLANS. Reduced fares are available for persons 12 through 21 years of age on a no reservations basis at 50% of normal jet coach fares to Continental U.S.A.

All fares quoted in U.S. dollars, taxes not included, and are subject to change without notice.

Some fares apply only to one direction or apply to routes not shown in this fare table. For details, call IATA.

Peak Period Economy fares apply to Transatlantic Travel Eastbound between May 22 and Aug. 6, Westbound between July 17 and Sept. 28. At all other times Regular Economy fares apply.

*Three-month 21 day Excursion fares apply year-round except where travel restrictions [illegible]. Eastbound from 1 July to 31 August and Westbound from 1 August to 15 September [illegible] to Europe [illegible] Eastbound from 1 November through 15 December and Westbound from 1 January through 15 March [illegible] each Eastbound or Westbound [illegible] portion of travel [illegible] minimum 14, maximum 21 days.

21 day Excursion fares apply year-round only to travel originating in the U.S.A. [illegible] Transatlantic travel [illegible] Peak Period Economy fares apply.

Discount Excursion fares apply from U.S. [illegible] and Canada to the [illegible] Sun. Certain travel restrictions apply, call IATA or the [illegible] Agent for reservations and details.

F. Fares apply 12:01 AM Monday to 12 noon Wednesday

W. Fares apply 12:01 AM Monday to 12 noon Thursday

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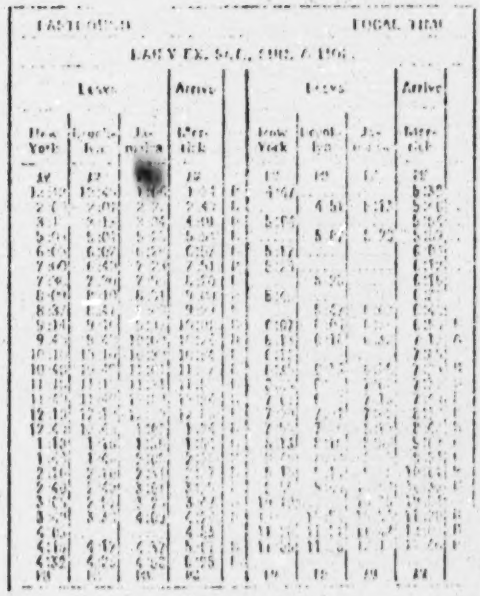
Reading railroad time-tables

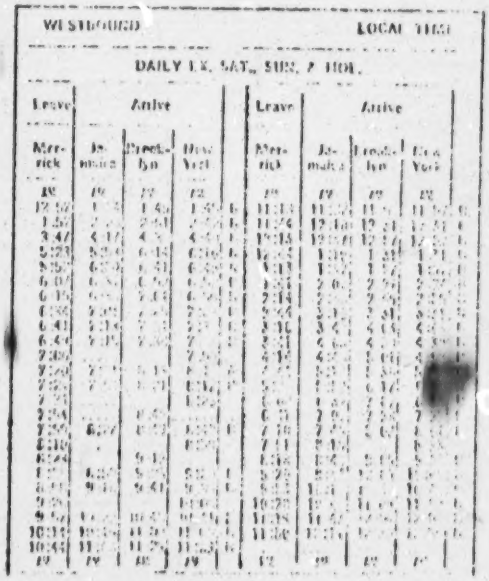
Duplicate and distribute a copy of a railroad time-table. Demonstrate how to read the time-table.

Present problem:
Mrs. Smith wants to take the latest possible train to arrive in New York City before 8 P.M. Which train should she take.

Mr. Jamison is at the Jamaica railroad station at 4:35 P.M. What is the next train he can get that will stop at Merrick station?

TIME-TABLE L.I.R.R. MERRICK





Student Activities

Ask students to obtain rate schedules and time-tables for airlines and railroads. Have students plan a trip.

TRIP PLAN

To _____ Via _____

Departure Date _____ Return Date _____
Time of Departure _____ Time of Departure _____
Time of Arrival _____ Time of Arrival _____
Kind of ticket purchased _____
Cost of ticket _____

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Taxi Driver

Determining the cost of passenger transportation

Teacher Activities

Pose the following problem:
How much would it cost you to go from 34th Street and 7th Avenue to Fifth Avenue and 82nd Street? (2 1/6 miles)

Explain the initial charge of 45¢ for the first 1/6 of a mile and 10¢ for each additional 1/3 of a mile (or fraction thereof). Discuss an appropriate tip, and how to compute the amount of the tip.

Student Activities

Ask students to compute the cost of the following taxi rides:

Distance	Initial 1/6 mile	Each add'l. 1/3 mile	Total	Tip	Total Cost
1 1/4 mi.	.45				
4 1/2 miles	.45				

Determining the cost of operating a taxi

Teacher Activities

Discuss the various items of expense to the taxi owner. Pro rate the cost per ride.
Demonstrate how to compute the cost of transporting a passenger.
Discuss:

Cost of medallion	Cost of gasoline
Cost of vehicle	Cost of oil
Cost of maintenance	Cost of transporting a rider
Cost of insurance	

Subway Cashier

Making change

Teacher Activities

Present problems:
Mr. Brown is a subway cashier. A passenger requests 12 tokens and offers a $5 in payment. How much change should Mr. Brown give to the passenger. Prepare and distribute a chart:

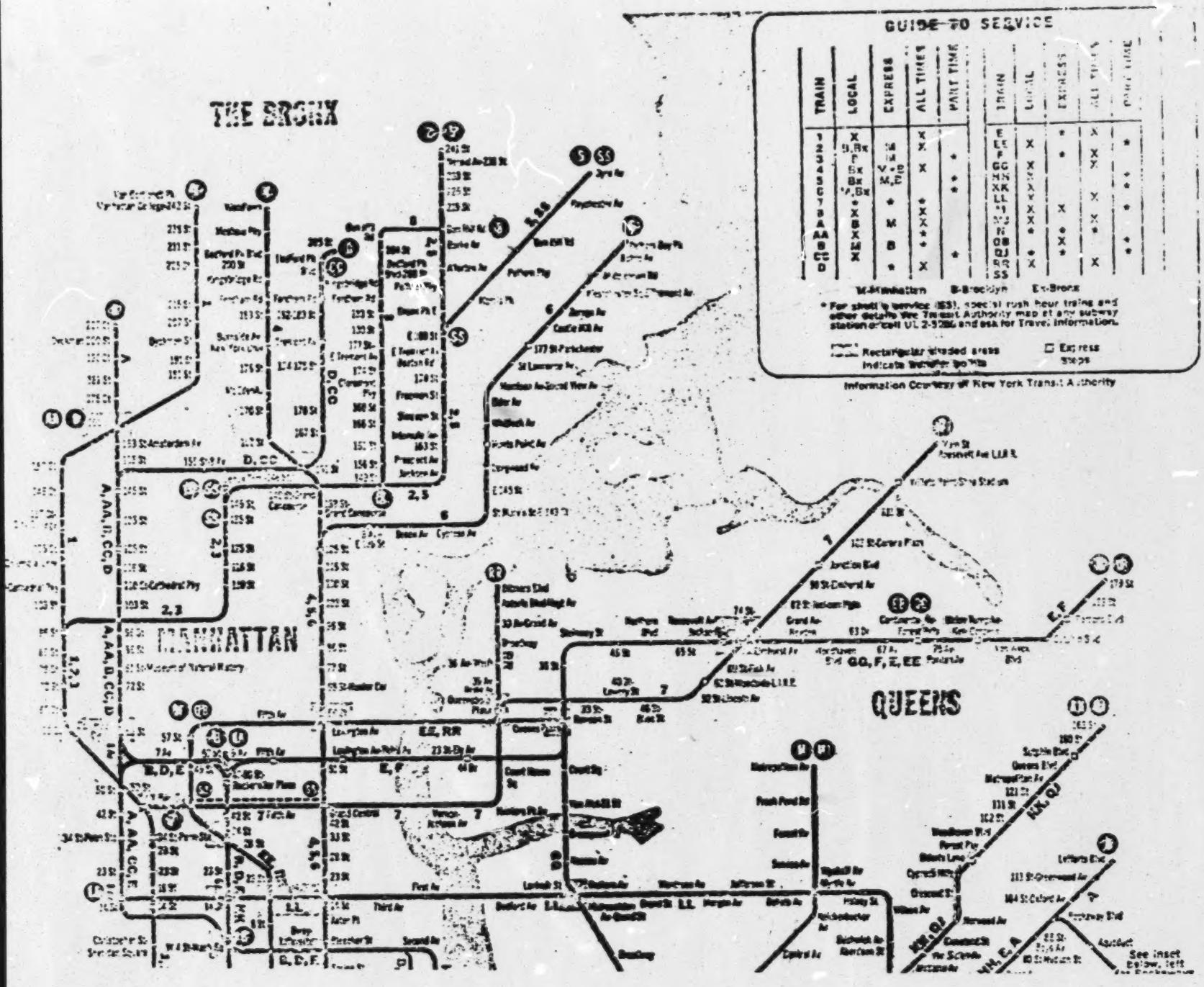
Number of Tokens Requested	Amount Given in Payment	Amount of Change
11	$1	
1	.50	
7	3	

Reading a subway map

Duplicate and distribute copies of the subway map.
Present problems:
The school employment bureau refers you to a job with a company located at 30th Street near 7th Avenue. How would you get there from school?
Take _____ Line at _____ station.
Ride to _____ station.

Student Activities

Plan routes of travel via subway to various points of interest or for business purposes.



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about documents

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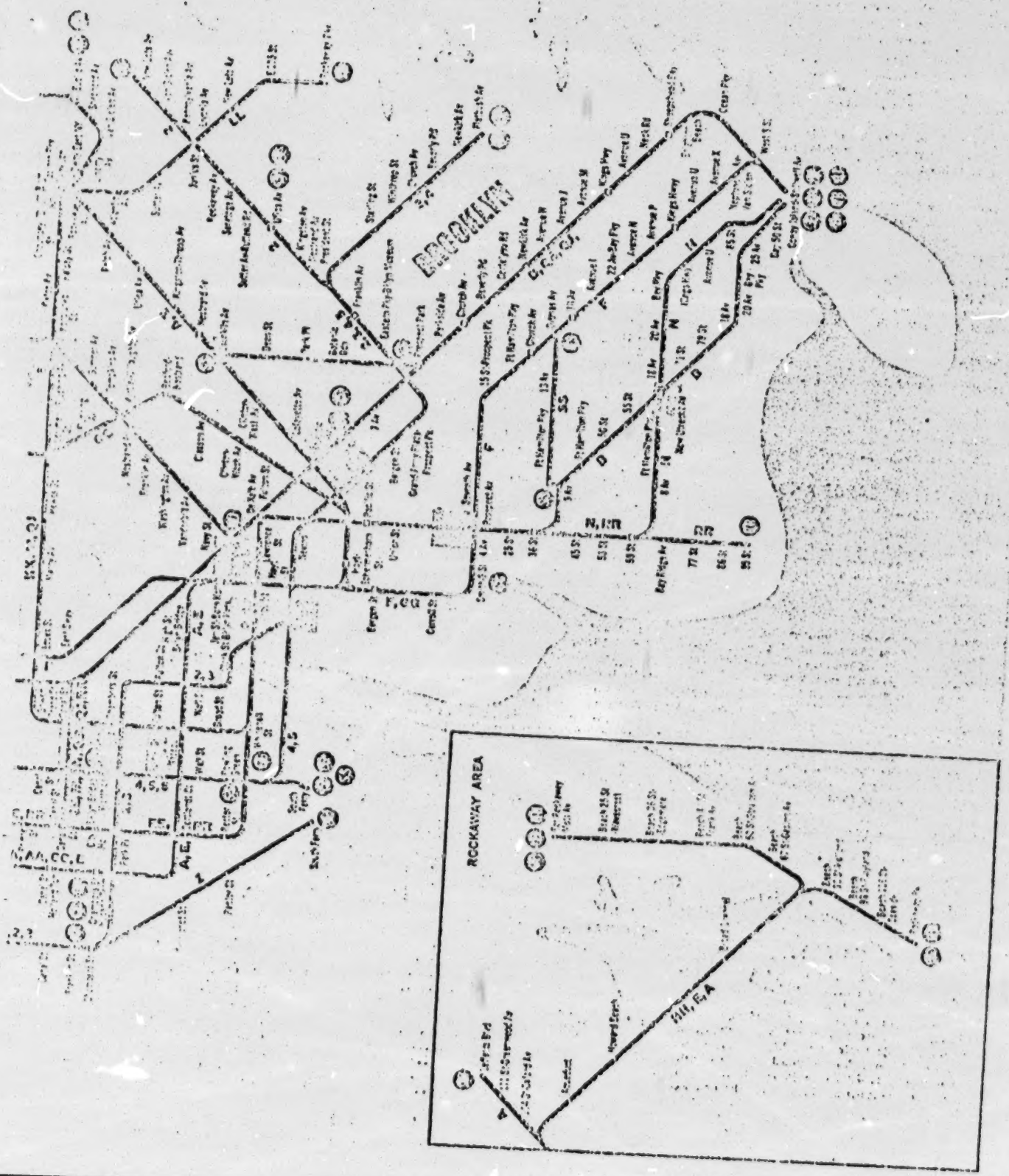

MATHEMATICAL SKILLS FOR WORKING IN A SERVICE INDUSTRY

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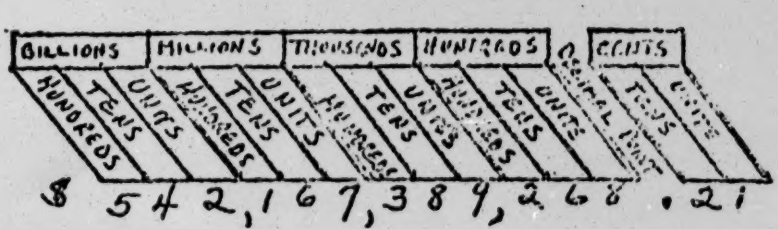
Bank Clerk

Issuing checks

Teacher Activities

Review monetary denominations, coins and bills.
Review reading monetary values.
Example:

$542,167,389,268.21



Pose the problem:
You are a teller at the Bank & Trust Company. Mr. Lopez, who wishes to pay his telephone bill with a bank check, brings a withdrawal ticket to you.

Use the chalkboard, or a transparency on the overhead projector, to demonstrate how to verify the withdrawal ticket and write a check.
Distribute either duplicated or printed forms (G-1 List).
Sample forms:

WITHDRAWAL TICKET

BOOK NO. 0735M $12.45

BANK AND TRUST COMPANY
NEW YORK, N. Y.

PLEASE PAY MYSELF OR BEARER

Twelve 45/100 DOLLARS

AND CHARGE TO MY ACCOUNT

☐ BY CHECK TO MY ORDER
☒ BY CHECK PAYABLE TO: New York Telephone Co.

SIGN HERE Pedro Lopez (Signature)

PRESENT ADDRESS 145 East 26 St.

CITY New York, N.Y. 10017

CK

CP

BF69 PAID BY: R

BANK and TRUST COMPANY
NEW YORK, N. Y.

No. _____

1-75XX
260

_____ 19 ____

PAY TO THE ORDER OF _____ $ _____

_____ DOLLARS

• 0260■75XX ■XXX XXXXXX

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Additional problems may be found in General Mathematics 9th Year, pp. 118-123.

Student Activities
Ask students to prepare withdrawal tickets and write checks.

Handling deposits

Teacher Activities
Review procedures for counting money: sort bills according to denominations, list, then add.
Example:

#Bills	Denominations	Total
3	$20	$60
5	10	50
3	5	15
7	1	7
	Total	$132

Spread coins (play money) on counter, count each denomination separately, list, then add.

Duplicate and distribute copies of deposit tickets
Demonstrate how to examine deposit tickets.
Discuss the information required on the ticket and the importance of examining the ticket to be sure it is complete and correct.
Demonstrate how to verify cash and checks listed on the deposit ticket. Discuss the five types of check endorsement.

DEPOSITED WITH
_____ BANK AND TRUST COMPANY
NEW YORK, N. Y.

DATE _____ 19__

FOR ACCOUNT OF (PLEASE PRINT FULL TITLE AND ACCOUNT NUMBER)

_____

_____

_____

ACCOUNT NUMBER

77-1568-900 FKos.-7-68 134

PLEASE ENDORSE ALL CHECKS

		DOLLARS	CENTS
CASH			
LIST EACH CHECK SEPARATELY	CHECKS 1		
	2		
	3		
	4		
	5		
BANK USE ONLY UNITS	6		
	7		
	TOTAL		

Student Activities
Using play money and check facsimiles, alternate the roles of teller and depositor for practice in verifying cash and checks listed on deposit tickets.

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Handling withdrawals

Teacher Activities

Duplicate and distribute sample withdrawal forms.
Demonstrate how to complete withdrawal forms.
Using play money, demonstrate how to count the money and pay the withdrawals.
(For sample withdrawal ticket, see page 21.)

Student Activities

Ask students to complete withdrawal forms. Students may alternate in the roles of teller and customer to demonstrate how to handle withdrawals.

Adding interest

Teacher Activities

Discuss the concept of simple interest. Compare interest rates offered by various banking institutions for the many savings plans available.

Amount Deposited Monthly	GROWTH WITH INTEREST COMPOUNDED QUARTERLY AT 4% in 1 yr.	5 yrs.	10 yrs.	15 yrs.	20 yrs.
$ 10	$ 122.62	$ 664.97	$ 1,478.37	$ 2,466.42	$ 3,674.40
20	245.25	1,329.95	2,952.74	4,932.85	7,348.80
30	367.87	1,994.92	4,429.11	7,399.27	11,023.44
40	490.50	2,659.90	5,905.47	9,865.70	14,697.92
50	613.12	3,324.87	7,381.84	12,332.12	18,372.40
100	1,226.24	6,649.74	14,763.68	24,664.24	36,744.80

Review changing percents to decimals by moving the decimal point two places to the left.
Practice: 4.34%, 1%, .09%, 50%
Develop the formula for simple interest: prt=I.
Discuss the meaning of principal, rate, and time.

Student Activities

Ask students to compute interest problems such as, $200 @ 5% for 2 years; $30 @ 4% for 1/2 year.

Collect newspaper advertisements placed by banks indicating the savings plans and interest rates offered, and to summarize the information:

Name of Bank	Savings Plans Offered	Interest Rate	I would use this savings plan if...

Computing interest on a loan

Teacher Activities

Discuss the new Truth, in Lending Law.
Discuss terms used with regard to loans:

PERSONAL INSTALMENT LOAN: Money borrowed from bank, or other credit institution by an individual for personal needs, repaid in regular monthly sums over a certain period of time.
SINGLE PAYMENT LOAN: A loan in which both principal and interest are repaid at one time.
INTEREST: The cost of a loan expressed in dollars or a percentage. (The rental fee.)
DISCOUNT: The cost of a loan subtracted in advance from the amount to be paid back.
FACE AMOUNT: The total amount of the loan before interest charges are deducted.
PROMISSORY NOTE: The paper you sign, promising to repay the total sum on specified terms.
CO-MAKER: The other signer of note when two people jointly guarantee to repay a loan.
COLLATERAL: Any property, like stocks, bonds or savings books offered as a guarantee that a loan will be repaid. (Not required for personal loan based on your signature as a wage earner.)

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Demonstrate how to figure the dollar cost of credit:

HOW TO FIGURE DOLLAR COST OF CREDIT

Multiply amount of monthly payment by number of monthly payments to be made.
Subtract from that total the amount financed. (Cash price minus down payment)
Difference will be dollar cost of credit.
EXAMPLE: A refrigerator costs $300 and can be paid for by making a $12 down payment and 12 monthly payments of $25.92 each.

MULTIPLY payments × months to be made ($25.92 × 12)	$311.04
SUBTRACT the amount financed (Cash price minus down payment)	$288.00
DOLLAR COST OF CREDIT	$ 23.04*
Total cost on credit ($300 cash price plus $23.04 credit cost)	$323.04

*Cost of credit equals $8 per $100 per year on unpaid balance of $288. This is equivalent to a simple annual rate of 14.8%.

TYPICAL CREDIT CHARGES

If charges are based on the beginning amount owed and are included in the 12 equal monthly installments:

If Charged:	Simple Annual Rate Is:
$4 per $100 or 4% per year	7.4%
$6 per $100 or 6% per year	11.1%
$8 per $100 or 8% per year	14.8%
$10 per $100 or 10% per year	18.5%
1% per month	22.2%

If charged only on unpaid amount owed:

If Charged:	Simple Annual Rate Is:
3/4 of 1% per month on unpaid balance	9%
5/6 of 1% per month on unpaid balance	10%
1% per month on unpaid balance	12%
1¼% per month on unpaid balance	15%
1½% per month on unpaid balance	18%
2½% per month on unpaid balance	30%

Demonstrate how to compute interest on a loan.

Student Activities

Complete problems in computing interest on various types of loans.

Prepare an interest chart:

6% interest

Amount of Loan	30 days	60 days	90 days	6 mos.	12 mos.	18 mos.
$ 50						
100						
125						

For enrichment: Discuss trust funds, joint accounts, savings bonds, counterfeit money, Federal Reserve Board, payer, payee.

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Balancing a check book

Teacher Activities

Duplicate and distribute copies of checks with stubs. Demonstrate how to record deposits and deduct amounts for checks drawn on the account.

#201 Amount____ 19____ To____ For____		
	Dol.	Cents
Bal. Frwd.		
Deposits		
Total		
This check		
Bal.Frwd.		

#201 New York, N.Y. ____ 19____

The Creditors National Bank

Pay to the order of

_____ $

_____ Dollars

Discuss bank charges for maintaining a checking account.

Student Activities

Record transactions and balance a check book using the following information about deposits and withdrawals:

Date	Deposits	Checks Drawn	Balance Forward
2/16			$121.30
2/17	$ 24.50		
2/19		$ 19.04	
2/20		71.98	
2/25	181.30		
2/25		45.87	
3/1		121.75	

Ask students to go to a local bank and obtain forms used when opening a checking account.

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Waiter or Waitress

Writing sales checks

Teacher Activities

Duplicate and distribute a sample menu and blank sales checks.

Pose the problem:
You work as a waiter (or waitress) at the Correlated Restaurant. Three customers at table #12 order as follows:

Customer #1	Customer #2	Customer #3
Western Sandwich	Hamburger	Tuna on Toast
Apple pie	French Fried Potatoes	Chocolate Ice cream
Coffee	Coke	Malted milk

Discuss the abbreviations used for various items of food.

Demonstrate how to complete the sales check. Add sales tax where applicable.

Student Activities

Students may alternate the roles of customer and waiter (or waitress), taking orders, completing sales checks, accepting payment, and giving change.

MATHEMATICAL SKILLS FOR GOVERNMENT EMPLOYMENT

Parking Enforcement Agent

Practicing for mathematical problems on civil service examinations.

Teacher Activities

Applicants for Parking Enforcement Agent examinations are required to answer questions similar to the ones below. Duplicate and distribute problems. Demonstrate how to solve them.

1. At a certain City garage there are 216 cars. Of these, $\frac{1}{2}$ are assigned to Department P, 1/3 to Department Q, 1/9 to Department R, and the rest to Department S. How many cars are assigned to Department S?

(A) 9 (B) 12 (C) 18 (D) 24.

2. In August a car travels 572 miles; in September, 438 miles; in October, 898 miles, and in December it travels 609 miles. If the five month average from August through December was 673 miles traveled a month, then the number of miles traveled in November was

(A) 638 (B) 706 (C) 774 (D) 888.

3. Suppose the Units R, S and T gave out a total of 1,715 parking tickets. If Unit R gave out twice as many tickets as Unit S, and Unit T gave out twice as many tickets as Unit R, the number of tickets given out by Unit S is

(A) 270 (B) 255 (C) 245 (D) 225.

4. A car travels at the average rate of 40 miles an hour on the highway. If it takes 5 hours to make a trip of 150 miles, 2/3 of which is on the highway and the rest on city streets, what was the average rate of speed of the car on city streets?

(A) 20 (B) 25 (C) 30 (D) 35.

5. A motorist uses 27 gallons of gas on a trip of 351 miles. How many gallons of gas would he use if he took a trip of 624 miles under the same condition?

(A) 45 (B) 46 (C) 47 (D) 48.

6. If the taxi rate in the City is 35¢ for the first 1/5 of a mile and 5¢ for each additional 1/5 of a mile, how far did a passenger travel whose fare was 95¢?

(A) 2 1/5 miles (B) 2 3/5 miles (C) 3 2/5 miles (D) 3 4/5 miles.

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Mathematical problems on civil service examinations (continued)

Answer questions 7 to 12 only according to the information given in the table below.

RIVER CITY - WEEKLY REPORT - WEEK ENDING - 7/17/65				
	No. of Parking Meters		No. of Summonses Issued	
	On Streets	In Parking Lots	Overtime Parking	Other Violations
Zone P	640	1,660	460	130
Zone Q	1,400	420	1,200	480
Zone R	920	460	520	180
Zone S	1,550	620	800	200
Zone T	750	2,250	400	120

7. Compared to the total number of parking meters "On Streets", the total number of parking meters "In Parking Lots" is

(A) 30 less (B) 60 less (C) 90 more (D) 30 more.

8. Of all the summonses given out in Zone S during the week, what per cent were for "Other Violations"?

(A) 25% (B) 20% (C) 15% (D) 5%.

9. The average number of summonses issued for overtime parking in each Zone during the week is most nearly

(A) 225 (B) 340 (C) 675 (D) 1,090.

10. Suppose that an employee can check 40 meters an hour on the streets and 3 times that number in a parking lot. If an employee works 7 hours a day, excluding a lunch period, and each meter is checked twice a day, how many employees must be assigned daily to Zone P to check all the meters?

(A) 7 (B) 8 (C) 10 (D) 12.

11. Suppose that a new parking lot is to be built in Zone Q. How many metered spaces must there be in this new parking lot so that Zone Q will have the same ratio of street meters to parking lot meters as Zone R?

(A) 700 (B) 440 (C) 350 (D) 280.

12. Comparing the total number of parking meters with the total number of summonses issued, it is correct to state that the

(A) zone with the smallest number of meters issued the smallest number of summonses (B) zone with the largest number of meters issued the largest number of summonses (C) zone with the smallest number of meters issued the largest number of summonses (D) zone with the largest number of meters issued the smallest number of summonses.

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Post Office Clerk

Teacher Activities

Obtain class sets of Domestic Postage Rates, Fees, and Information from the local post office.

Determining postage required

Discuss the various classes of postal service available: first class, second class, third class, fourth class. Discuss other services available such as insurance, return receipts, certified mail and so forth.

Present problems:
You are a post office clerk. A man wishes to send a package to Albany, New York (150-300 miles). The package weighs 2 1/2 pounds. How much postage should be attached to the package?

A woman requests 9 airmail stamps, 7 first class stamps, and 5 postcards. She gives you $2.00 in payment. How much change should you give her?

FIRST CLASS

Kind of Mail	Rate
All first-class mail weighing 13 ounces or less except postal and post cards.	6¢ per ounce.
Over 13 ounces	Priority mail (heavy pieces) rates apply.
Single postal cards sold by the post office.	5¢ each.
Double postal cards sold by the post office.	10¢ (5¢ each half).
Single post cards	5¢ each.
Double post cards (reply portion of double post card does not have to bear postage when originally mailed).	10¢ (5¢ each half).
Business reply mail:	
Cards	7¢ each.
Other than cards:	
Weight not over 2 ounces	6¢ per ounce or fraction of an ounce plus 2¢ per piece.
Weight over 2 ounces	6¢ per ounce or fraction of an ounce plus 5¢ per piece.
Over 13 ounces	Priority mail (heavy pieces) rates apply plus 5¢ per piece.

SECOND CLASS

(Newspapers and periodical publications with second-class mail privileges.)

Copies mailed by public.	5¢ for first 2 ounces, 1¢ each additional ounce or fraction thereof, or the fourth-class rate, whichever is lower.

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THIRD CLASS

Circulars, books, catalogs and other printed matter, merchandise, seeds, cuttings, bulbs, roots, scions, and plants, weighing less than 16 ounces:

SINGLE RATE	BULK RATE
6¢ first 2 ounces, 2¢ each additional ounce or fraction.	CONSULT POSTMASTER

FOURTH-CLASS (PARCEL POST)

Weight 1 pound and not exceeding pounds	Local	Zones						
		1 and 2	3	4	5	6	7	8
		Up to 150 miles	150 to 300 miles	300 to 600 miles	600 to 1,000 miles	1,000 to 1,400 miles	1,400 to 1,800 miles	Over 1,800 miles
2	$0.60	$0.60	$0.60	$0.65	$0.70	$0.70	$0.85	$0.90
3	.50	.65	.70	.75	.85	.95	1.05	1.15
4	.55	.70	.75	.85	.95	1.10	1.20	1.35
5	.55	.75	.80	.90	1.05	1.25	1.40	1.60
6	.55	.80	.90	1.00	1.15	1.40	1.55	1.75
7	.60	.90	.95	1.10	1.35	1.50	1.75	1.95
8	.60	.95	1.00	1.15	1.60	1.65	1.90	2.15
9	.65	1.00	1.05	1.25	1.50	1.80	2.05	2.35
10	.65	1.05	1.15	1.35	1.65	1.90	2.25	2.55

INSURANCE

FEES (IN ADDITION TO POSTAGE)

LIABILITY	FEE
$0.01 to $15	$0.20
$15.01 to $50	.30
$50.01 to $100	.40
$100.01 to $150	.50
$150.01 to $200	.60

Liability for insured mail is limited to $200.

Restricted delivery. (Not available for mail insured for $15 or less) ..... 50¢

Return receipts. (Not available for mail insured for $15 or less)

COD MAIL

Consult Postmaster for fees and conditions of mailing.

CERTIFIED MAIL

Fee (in addition to postage) ..... 30¢

Restricted delivery ..... 50¢

REGISTRY

REGISTRY FEES (IN ADDITION TO POSTAGE)

Declared actual value (No limit)	Fees: If sender does not have commercial or other insurance	Postal Liability
$0.00 to $100	$0.80	Without commercial or other insurance — declared value.
$100.01 to $200	1.05	
$200.01 to $400	1.30	
$400.01 to $600	1.55	With commercial or other insurance — declared value or protected.
$600.01 to $800	1.80	
$800.01 to $1,000	2.05	

RETURN RECEIPTS

CERTIFIED MAIL NUMBERED INSURED REGISTERED

Requested at time of mailing:

Showing to whom and when delivered ..... 15¢

Showing to whom, when, and address where delivered ..... 35¢

Requested after mailing:

Showing to whom and when delivered ..... 25¢

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Demonstrate how to use a weigh scale for weighing letters, packages, and other items for mailing.

Student Activities
Practice using a weigh scale.
Ask students to visit the post office and to complete a visit report:

Location of Post Office _____

Date of Visit _____ Name _____

Activities Observed	What The Postal Employee Was Doing	Skills Required On The Job

Practicing for mathematical problems on civil service examinations

Teacher Activities
Number series questions frequently appear on the postal examination. Duplicate and distribute sample exercises. Demonstrate how to find the missing number in the series.

Student Activities
Complete number series problems. Problems not completed in class may be completed as homework.

1. 10 11 12 10 11 12 10.....	A) 10 11	B) 12 10	C) 11 10	D) 11 12	E) 10 12
2. 4 6 7 4 6 7 4.....	A) 6 7	B) 4 7	C) 7 6	D) 7 4	E) 6 6
3. 7 7 3 7 7 4 7.....	A) 4 5	B) 4 7	C) 5 7	D) 7 5	E) 7 7
4. 3 4 10 5 6 10 7.....	A) 10 8	B) 9 8	C) 8 14	D) 8 9	E) 8 10
5. 6 6 7 7 8 8 9.....	A) 10 11	B) 10 10	C) 9 10	D) 9 9	E) 10 9
6. 3 8 9 4 9 10 5.....	A) 6 10	B) 10 11	C) 9 10	D) 11 6	E) 10 6
7. 2 4 3 6 4 8 5.....	A) 6 10	B) 10 7	C) 10 6	D) 9 6	E) 6 7
8. 11 5 9 7 7 9 5.....	A) 11 3	B) 7 9	C) 7 11	D) 9 7	E) 3 7
9. 12 10 8 8 6 7 4.....	A) 2 2	B) 6 4	C) 6 2	D) 4 6	E) 2 6
10. 20 22 22 19 21 21 18.....	A) 22 22	B) 19 19	C) 20 20	D) 20 17	E) 19 17
11. 5 7 6 10 7 13 8.....	A) 16 9	B) 16 10	C) 9 15	D) 10 15	E) 15 9
12. 13 10 11 15 12 13 17.....	A) 18 14	B) 18 15	C) 15 16	D) 14 15	E) 15 18

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MATHEMATICAL SKILLS FOR CAREER PLANNING

Preparing for pre-employment tests

Teacher Activities
Duplicate and distribute sample mathematics questions that appear frequently on pre-employment tests.

SAMPLE PRE-EMPLOYMENT TEST

I. Number sense

A. Number relationships

1) 90 is how much greater than 62?
2) 62 is how much less than 90?
3) 8 times 5, 5 times _____ equal _____
4) 6 x 7, 7 x _____ equal _____ equal 14 x _____

B. Arrange in descending order:

1) 14 23 17 9 63 _____
2) 1 1/4 1/2 1 1/4 2 _____
3) 1/2 3/4 5/8 _____
4) 2 2.2 .22 .222 _____
5) 3% .03% .3% 3.3% _____

C. Arrange in ascending order:

1) 1 1/4 1/2 3/4 1 1/4 _____
2) .99 .9 9.9 9.99 _____

D. Which number in each group is greater than

1) 6%: 6 .6% .06% .7% _____
2) 40%: 2/5 1/2 1/3 2/6 _____
3) 5/8: 1/2 1/4 .333 .8 _____

E. Which number in each group is the greatest amount

1) 7 .77 7.3 .84
2) 1/2 60% 3/4 80%

G. Which pairs are exact duplicates:

1) 1357 7531
2) 121212 122121
3) 310310310 310310310
4) 7654765476 7654765476

II) One number in each of the following series is omitted. Find the missing numbers.

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1) 1 3 5 7 ____
2) 4 8 ____ 16
3) 1 1 2 3 5 8 ____
4) 3 8 13 ____
5) 40 20 10 ____
6) ____ ½ 1 1½ 2
7) 1 2 4 7 ____

I) Which number in each series does not fit in with the pattern set by the others?

1) 2 4 8 16 24 64

2) ½ 1 1½ 13/4 2½

II. Logic

A. Assume the first two statements are true Is the final statement true?

1) Charlie the tuna is a fish. All fish swim. Charlie the tuna swims.
a) true b)false c)not certain

2) Some boys play baseball. Charles is a boy. Charles plays baseball.
a) true b)false c) not certain

3) If Mary goes to the movies then Mary spends money. Mary spends money. Therefore Mary goes to the movies.
a)true b) false c)not certain

III. Fundamental Arithmetic for retail selling

Add

89	789	78965	$8.78¢
16	67	453	.45
89	6	6745	34.25
24	345	243	119.06

Subtraction

119	1.098	234	$45.98
- 64	-.675	-189	- 36.89

Multiplication

8 x7 .12 x 7 9.21 x 23

17x10 9x100 433x1000

$1.56 per shirt x6 shirts	7.65 x.09	.0069 x 1.3

Division

9) $14.95 1.67) 534.4

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NON-CORRELATED TOPICS
(Optional)

Other Number Systems

Base 5

Teacher Activities

The General Mathematics-9th Year curriculum bulletin, pages 245-251, contains a detailed lesson development of other number systems.

To introduce the concept of base 5, develop the concept that a hand is equal to five fingers. Ask, how would you represent 23 fingers, in terms of a hand? Answer: 4 hands, 3 fingers.

Introduce exponents.

	4	3	2	1	0
exponential	5	5	5	5	5
numerical	625	125	25	5	1
		1	3	2	1

Evaluate the above number: 1321_{five}

$1(125) + 3(25) + 2(5) + 1(1) = 211$

Distribute additional problems for practice.

Base 2

Introduce the binary system. See General Mathematics, 9th Year, pages 251-270.

Base 12

Use the twelve hour clock and the concept of dozens to introduce base 12.

APPENDIX

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